

In The Claims

Claims 1, 3, 4, 9, 11-14, 18, 25 and 26 have been amended.

Please amend claims as follows:

1. (Currently Amended) A method for damping vibration induced by a roll (1) in a paper machine or in a paper finishing device by means of a dynamic damper which comprises: ~~having an additional~~ a weight (4, 4a, 4b) and a spring (3, 3a, 3b), connecting the ~~additional~~ weight (4, 4a, 4b) to a vibrating system (2) of the paper machine or paper finishing device, whereby the dynamic damper is tuned by means of a control device (9) to a tuning frequency that is substantially equal to a multiple of the rotational frequency of the roll (1) that is closest to the natural frequency of the vibrating system (2), or to a tuning frequency that substantially corresponds to the problematic excitation frequency of the vibrating system (2), wherein said ~~additional~~ weight (4, 4a, 4b) is suspended from said vibrating system by means of said spring (3, 3a, 3b) and in that, the spring constant of the spring (3, 3b) of the dynamic damper and/or the mass of the ~~additional~~ weight (4a, 4b) of the dynamic damper is/are changed by means of the control device (9) in order to tune the natural frequency of the dynamic damper so as to be said tuning frequency.

2. (Previously Presented) A method as claimed in claim 1, wherein the vibration frequencies of the vibrating system (2) are measured constantly by means of one or more vibration detectors (6), the measurement signal given by the vibration detector (6) is

Appl. No. 09/403,912

Amdt. dated January 4, 2005

Reply to Office Action of October 8, 2004

amplified by means of an amplifier (7) and fed into a vibration analyser (8), which identifies the problematic excitation frequency and converts said problematic excitation frequency into a control signal, which is fed into a control device (9) in order to tune the dynamic damper.

3. (Currently Amended) A method as claimed in claim 1, wherein the spring of the dynamic damper is a rod (3) attached at one end thereof to the vibrating system (2), wherein the spring constant is changed by changing the position of the ~~additional~~ weight (4) on the rod (3).

4. (Currently Amended) A method as claimed in claim 3, wherein when the desired tuning frequency of the dynamic damper has been obtained, the ~~additional~~ weight is locked in place on the rod by means of a locking means.

5. (Previously presented) A method as claimed in claim 4, wherein the locking means (30) is operated by means of compressed air.

6. (Previously presented) A method as claimed in claim 1, wherein a rod (3) made of memory metal is used as the spring of the dynamic damper.

7. (Previously presented) A method as claimed in claim 6, wherein the natural frequency of the damper is tuned by regulating the temperature of the rod (3) made of the memory metal material.

8. (Previously presented) A method as claimed in claim 7, wherein the temperature of the rod (3) is regulated by means of heaters.

9. (Currently Amended) An apparatus for damping vibration induced by a roll (1) in a paper machine or in a paper finishing device, said apparatus having a dynamic damper which comprises ~~an additional a~~ weight (4, 4a, 4b) and a spring (3, 3a, 3b) connecting the ~~additional~~ weight (4, 4a, 4b) to a vibrating system (2) of the paper machine or paper finishing device, said apparatus further comprising a control device which is arranged to tune the dynamic damper to a tuning frequency that is substantially equal to a multiple of the rotational frequency of the roll (1) that is closest to the natural frequency of the vibrating system, or to a frequency that substantially corresponds to the problematic excitation frequency of the vibrating system wherein said ~~additional~~ weight (4, 4a, 4b) is suspended from said vibrating system (2) by means of said spring (3, 3a, 3b) and in that said control device (9) is arranged to change the spring constant of the spring (3, 3b) of the dynamic damper and/or the mass of the ~~additional~~ weight (4a, 4b) of the dynamic damper in order to tune the natural frequency of the dynamic damper so as to be said tuning frequency.

10. (Previously presented) An apparatus as claimed in claim 9, wherein the apparatus comprises one or more vibration detectors (6) which measure(s) the vibration frequencies of the vibrating system (2) constantly and which is/are arranged to transmit measurement signal, an amplifier (7) that amplifies the measurement signal, a vibration analyser (8) which is arranged to receive the measurement signal transmitted by the vibration detector (6) and amplified by the amplifier (7), to identify the problematic excitation frequency from said measurement signal and to convert said problematic excitation frequency into a control signal to be fed into the control device (9) in order to tune the dynamic damper.

11. (Currently Amended) An apparatus as claimed in claim 9, wherein the spring (3, 3b) of the dynamic damper is a rod fixed at one end thereof to the vibrating system (2) in a substantially horizontal direction, on support of which rod the additional weight (4, 4b) is mounted, and that the control device (9) is arranged to change the spring constant of the spring (3, 3b) of the dynamic damper by changing the position of the additional weight (4, 4b) on the rod (3, 3b).

12. (Currently Amended) An apparatus as claimed in claim 11, wherein a locking means is mounted on the rod serving as the spring of the damper in order to lock

the ~~additional~~ weight in place when the desired tuning frequency of the damper has been obtained.

13. (Currently Amended) An apparatus as claimed in claim 11, wherein the rod (3) and the ~~additional~~ weight (4) fitted on the rod are provided with matching threads (3'), and that the position of the ~~additional~~ weight (4) on the rod (3) can be regulated by rotating said ~~additional~~ weight on the rod.

14. (Currently Amended) An apparatus as claimed in claim 13, wherein the locking means (30) is arranged to act in the axial direction of the rod (3) and to produce an axial force acting on the ~~additional~~ weight (4) in order to provide a frictional force necessary for locking between the matching threads on the rod (3) and on the ~~additional~~ weight (4).

15. (Previously presented) An apparatus as claimed in claim 12, wherein the locking means (30) is a piston device fixed onto the rod.

16. (Previously presented) An apparatus as claimed in claim 15, wherein the piston device (30) is telescopic in order to provide the necessary stroke length.

17. (Previously presented) An apparatus as claimed in claim 12, wherein the locking means (30) is operated by compressed air.

18. (Currently Amended) An apparatus as claimed in claim 9, wherein the ~~additional~~ weight (4, 4b) included in the dynamic damper comprises a container suspended from the spring (3a, 3b) and filled with a liquid, the amount of the liquid in said container being adjustable in order to regulate the mass of the ~~additional~~ weight (4a, 4b).

19. (Previously presented) An apparatus as claimed in claim 18, wherein the control device (9) is connected to a pump (21) and to a valve (22) in order to regulate the amount of the liquid.

20. (Previously presented) An apparatus as claimed in claim 9, wherein the control device comprises a stepping motor in order to change the location of the weight (4, 4b) on the spring (3, 3b).

21. (Previously presented) An apparatus as claimed in claim 9, wherein the apparatus is fitted so as to dampen vibration in a nip in which at least one of the rolls forming the nip is provided with a soft coating (9).

22. (Previously presented) An apparatus as claimed in claim 9, wherein the dynamic damper and the vibration detector(s) (6) are fitted and fixed to a bearing housing (2) of the roll.

23. (Previously presented) An apparatus as claimed in claim 9, wherein the spring of the dynamic damper is a rod (3) made of memory metal.

24. (Previously presented) An apparatus as claimed in claim 23, wherein the natural frequency of the damper is arranged to be tuned by regulating the temperature of the rod made of the memory metal material.

25. (Currently Amended) An apparatus as claimed in claim 24, wherein, in order to regulate the temperature of the rod, the apparatus is provided with electric resistors or equivalent heaters.

26. (Currently Amended) An apparatus as claimed in claim 23, wherein the additional weight (4) is fixed to the rod (3) rigidly and without clearance.